Amendments under PCT Article 34

We amended the claims and the corresponding parts of the specification, under PCT Article 34 on January 13, 2005.

The amended parts are as follows:

1. Claims 1, 3-6, and 11-12 were amended.
2. Claim 2 was cancelled.
3. Page 2, line 7 to page 3, line 2 of the translation of original PCT specification, "A first uneven display correction method according ... the light-emission start gradation level of the reference area"
4. Page 4, lines 12-21 of the translation of the original PCT specification, "The first step includes, for example, ... and the light-emission start gradation level of the reference area.
5. Page 4, line 22 to page 5, 14 of the translation of the original PCT specification, "The first step includes, for example, ... and the light-emission start gradation level of the reference area".
6. Page 5, line 24 of the translation of the original PCT specification, "A second uneven display correction method."
7. Page 6, line 10 of the translation of the original PCT specification, "In the second uneven display correction method."
8. Page 7, line 7 of the translation of the original PCT specification, "In the second uneven display correction method."

Appendixes

1) Amended Claims
2) Amended Parts of Specification

(Page 2, line 6 to page 7, line 16 of the translation of the original PCT specification as filed; amended parts underlined)

DISCLOSURE OF THE INVENTION

A first uneven display correction method according to the invention, characterized by including a first step of dividing a display area of a display panel into a plurality of unit areas, the first step setting one arbitrary unit area among the unit areas at a reference area, the first step previously determining a value as a correction parameter in each unit area, the value corresponding to a difference between a light-emission start gradation level of the unit area and the light-emission start gradation level of the reference area; and a second step of correcting an input video signal based on the correction parameter determined in each unit area, wherein the first step includes an a step of dividing a display area of a display panel into a plurality of unit areas; a b step of measuring brightness of each unit area in one predetermined gradation level; a c step of determining a light-emission efficiency characteristic (gamma characteristic) in an arbitrary unit area; and a d step of computing the value as the correction parameter in each unit area by setting one arbitrary unit area among the unit areas at the reference area based on the brightness measured in each unit area in the b step and the light-emission efficiency characteristic determined in the c step, the value corresponding to the difference between the light-emission start gradation level of the unit area and the light-emission start gradation level of the reference area.

In the b step, for example, the brightness of each unit area is

measured with a surface brightness measuring apparatus. In the b step, the brightness of each unit area is measured by measuring current passing through the display panel.

Each unit area may be an area of one pixel unit, or each unit area may be an area having a predetermined size including a plurality of pixels. Each unit area may be a divided area which is obtained by dividing the display area of the display panel into a plurality of display areas in a laser annealing position moving direction during a display panel producing process. Each unit area may be a divided area which is obtained by dividing the display area of the display panel into the plurality of display areas in a direction orthogonal to the laser annealing position moving direction while dividing the display area of the display panel into the plurality of display areas in the laser annealing position moving direction during the display panel producing process.

In the case where each unit area is an area of one pixel unit, the second step corrects, for example, the input video signal based on the correction parameter according to a pixel position of the input video signal. In the case where each unit area is an area having a predetermined size including a plurality of pixels, the second step includes, for example, a step of determining the correction parameter according to the pixel position of the input video signal by performing second-order linear interpolation on the correction parameters of four unit areas near the pixel position of the input video signal; and a step of correcting the input video signal based on the correction parameter according to the pixel position of the input video signal.

The unit area corresponding to the highest brightness in the

brightness measured in the b step is determined as a reference unit area, and the uneven display correction method includes a fourth step of allocating the number of input video signal levels to the number of gradation levels in which a correction parameter maximum value is subtracted from the whole number of gradation levels while the correction parameter determined in the d step is set at the correction parameter maximum value for the unit area corresponding to the lowest brightness in the brightness measured in the b step, and the second step may be performed after the fourth step.

A second uneven display correction method according to the invention, characterized by including a first step of dividing a display area of a display panel into a plurality of unit areas, the first step setting one arbitrary unit area among the unit areas at a reference area, the first step previously determining a value as a correction parameter in each unit area, the value corresponding to a difference between a light-emission start gradation level of the unit area and the light-emission start gradation level of the reference area; and a second step of correcting an input video signal based on the correction parameter determined in each unit area, wherein the first step includes a step of determining an adjustment value for adjusting a black reference voltage such that the light-emission start gradation level of the reference area becomes a zero level except that the light-emission start gradation level is the zero level; and a step of previously determining a value as the correction parameter in each unit area after the light-emission start gradation level of the unit area is substituted for the light-emission start gradation level of the each unit area of the post-black reference voltage adjustment, the value corresponding to the difference between the light-

emission start gradation level of the unit area and the light-emission start gradation level of the reference area.

In the second uneven display correction method, the first step includes, for example, an e step of dividing a display area of a display panel into a plurality of unit areas; an f step of measuring brightness of each unit area in two predetermined gradation levels different from each other; a g step of determining a light-emission efficiency characteristic in an arbitrary unit area; an h step of setting one arbitrary unit area in the unit areas at a reference area, the h step determining an adjustment value for adjusting the black reference voltage such that the light-emission start gradation level of the reference area becomes a zero level based on two values of the brightness and the light-emission efficiency characteristic, the two values of the brightness being measured in two gradation levels previously determined with respect the reference area in the f step, the light-emission efficiency characteristic being determined in the g step; and an i step of computing a value as the correction parameter in each unit area based on the brightness measured in each unit area in the f step, the light-emission efficiency characteristic determined in the g step, and the adjustment value determined in the h step, the value corresponding to the difference between the light-emission start gradation level of the unit area and the light-emission start gradation level of the reference area.

The unit area corresponding to the highest brightness is determined as a reference unit area in the brightness measured in the f step, and the first uneven display correction method includes a fifth step of allocating the number of input video signal levels to the number of gradation levels in

which a correction parameter maximum value is subtracted from the whole number of gradation levels while the correction parameter determined in the i step is set at the correction parameter maximum value for the unit area corresponding to the lowest brightness in the brightness measured in the f step, and the second step may be performed after the fifth step.

A third uneven display correction method according to the invention, characterized by including a first step of dividing a display area of a display panel into a plurality of unit areas, the first step setting one arbitrary unit area among the unit areas at a reference area, the first step previously determining a correction parameter for approximately calculating a difference in input video signal for the same brightness between a light-emission efficiency characteristic for each input video signal level in the unit area and the light-emission efficiency characteristic for each input video signal level in the reference area in each unit area, with the use of the input video signal level as a variable; and a second step of correcting an input video signal based on the correction parameter determined in each unit area.

In the third uneven display correction method, the first step includes, for example, an a step of dividing a display area of a display panel into a plurality of unit areas; a b step of measuring brightness of each unit area in a first predetermined gradation level; a c step of measuring brightness of each unit area in a second predetermined gradation level; a d step of determining a light-emission efficiency characteristic in an arbitrary unit area; an e step of computing the difference in input video signal for the same brightness between the light-emission efficiency characteristic for each input video signal level in the unit area and the light-emission efficiency

characteristic for each input video signal level in the reference area at the first gradation level in each unit area based on the brightness measured in each unit area in the b step and the light-emission efficiency characteristic determined in the d step; an f step of computing the difference in input video signal for the same brightness between the light-emission efficiency characteristic for each input video signal level in the unit area and the light-emission efficiency characteristic for each input video signal level in the reference area at the second gradation level in each unit area based on the brightness measured in each unit area in the c step and the light-emission efficiency characteristic determined in the d step; and a g step of determining the correction parameter based on the difference determined in each unit area in the e step and the difference determined in each unit area in the f step.

In the third uneven display correction method, the correction parameters are, for example, α and β given by the following formula:

$$Vth = (\alpha \times Yin/Ymax)+\beta,$$

where Yin: input video signal level,

Ymax: maximum value of signal level in scope of input video signal, and

Vth: approximate value of difference in input video signal for the same brightness between light-emission brightness characteristics for each input video signal level in a certain unit area and for each input video signal level in reference area when input video signal level exists at Yin.